VISHNEVSKIY, M.Ye.; LYUBIMOV, V.A.; TRET'YAKOV, Ye.F.; GRISHUK, G.I.

Investigation of polarization of internal conversion electrons following β-decay of heavy elements. Zhur.eksp.i teor.fiz. 38 no.5:1424-1429 My '60. (MIRA 13:7)
(Electrons) (Beta rays)

83576

S/056/60/038/005/009/050
B006/B070

24.6520

AUTHORS: Vishnevskiy, M. Ye., Lyubimov, V. A., Tret'yakov, Ye. F., Grishuk, G. I.

TITLE: Investigation of the Polarization of Internal Conversion Electrons Following the β^--Decay of Heavy Elements 79

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 38, No. 5, pp. 1424-1429

TEXT: The polarization of internal conversion electrons in transitions following β^- decays was predicted by A. I. Alikhanov and V. A. Lyubimov, and experimentally discovered by Lyubimov and Vishnevskiy. The theory of this effect was developed by V. B. Berestetskiy, A. P. Rudik, and B. V. Geshkenbeyn. The results of the present work were communicated to the International Conference on the Physics of High Energies (Kiyev, July 1959). The authors investigated the polarization of conversion electrons for transitions following the β^- decay of Tm^{170}, Re^{186}, Hg^{203}, and Pa^{233}. The apparatus they used is schematically shown in Fig. 1. The arrangement and the method of the experiments are briefly discussed in the introduction.

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83576

Investigation of the Polarization of Internal Conversion Electrons Following the β^--Decay of Heavy Elements

S/056/60/038/005/009/050
B006/B070

The results are individually discussed for the various isotopes. The conversion electrons were found to be polarized in the direction of the emitted β-particles for Tm^{170} and Re^{186}, and in the opposite direction for Hg^{203} and Pa^{233}. The results obtained are compared in part with those of other authors. Tm^{170}: $2S\langle\sigma\rangle = 0.19 \pm 0.03$, and with a correction for the finite thickness of the scatterer according to Alikhanov, Lyubimov, and G. P. Yeliseyev: $(2S\langle\sigma\rangle)_0 = 0.22 \pm 0.03$. The polarization of the conversion electrons yielded $\langle\vec{\sigma}\rangle_{exp} = (0.49 \pm 0.06)\vec{v}/c$, the average value of v/c for the β-particles recorded being 0.78. The results are compared with the theory of Geshkenbeyn, which gives $\langle\vec{\sigma}\rangle_{theor} = +0.488\ \vec{v}/c$. Pa^{233}: The following values were obtained for an asymmetry factor of scattering $R = 1.10 \pm 0.02$, when corrections were made for the finite thickness of the scatterer ($0.45\ mg/cm^2$) and for the admixture of cascade transitions:
$\langle\vec{\sigma}\rangle = (-0.048 \pm 0.14)\ \vec{v}/c$ for an average value of $v/c = 0.56$. For the possible spin values in the ground state of Pa^{233}, the theoretical results

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TRET'YAKOV, Ye.F.; KONDRAT'YEV, L.N.; KHLEBNIKOV, G.I.; GOL'DIN, L.L.

Spectrum of internal conversion electrons accompanying the α-decay of Pu^{238} and Pu^{240}. Zhur.eksp. i teor.fiz. 36 no.2: 362-366 F '59. (MIRA 12:4)
(Electrons--Spectra) (Plutonium--Decay)

21(7)

AUTHORS: Tret'yakov, Ye. F., Kondrat'yev, L. N., Khlebnikov, G. I., Gol'din, L. L.

SOV/56-36-2-3/63

TITLE: The Spectrum of Internal Conversion Electrons Accompanying α-Decay of Pu^{238} and Pu^{240} (Spektr elektronov vnutrenney konversii, soprovozhdayushchikh α-raspad Pu^{238} i Pu^{240})

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 2, pp 362-366 (USSR)

ABSTRACT: The investigation of the decay of even-even nonspherical nuclei and of the energy of excited levels, especially the α-decay of Pu^{238} and Pu^{240}, is of very great theoretical importance. Investigation of the α-decay of these nuclei and of the levels of daughter nuclei occurring in this decay is carried out either by the α-spectrometry method, by that of γ-γ coincidence, or, as in the present paper, by the analysis of the conversion electron spectrum accompanying this decay. Measurements were carried out by means of a β-spectrometer with toroidal magnetic field and α-e-coincidence circuit. The method has already been described (Refs 1, 2). Scintillation counters with stilbene

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crystals were used for β-counting. Electron energy was determined by comparison with the conversion electron energy of the transitions 2+→0+ (43.5 kev) and 4+→2+ (99.8 kev) in U^{234}, the daughter nucleus of Pu^{238}. (These exact data were obtained by Perlman (Perelman)(Ref 3)). For the investigation of the conversion electron spectrum occurring in the α-decay of Pu^{238} which therefore supplies data concerning the level of U^{234}, a source with 1 cm diameter and an intensity of 40μC was used. The results obtained by the investigation are shown by figure 1 (course of the spectrum with assignation of individual peaks), figure 2 (scheme of U^{234}-levels: 499 kev(8+), 295.9 kev(6+), 143.3 kev(4+), 43.5 kev(2+), containing data from references 3 and 4), and by table 1 (energy of U^{234}-levels and intensity of α-lines of Pu^{238}, containing data from references 3, 4, 5). For the investigation of the conversion spectrum of Pu^{240}

a source of only 5μC was used, and the spectrum was investigated within the range of 20 -220 kev. Figure 3 again shows the spectrum, figure 4 the level scheme of U^{236} (daughter nucleus of Pu^{240}): 309 kev (6+), 239 kev (3?), 210 kev (1?), 148.9 kev (4+), 45.3 kev (2+). The lines with (?) are from reference 5, but were also observed by Kondrat'yev et al. (Ref 6). Table 2 shows the intensities of the α-lines (Pu^{240}) and the energies of the U^{236}-levels in comparison with the results obtained by other authors (Refs 3, 6, 7). The authors finally thank G. I. Grishuk, V. F. Konyayev and Yu. N. Chernov for helping to carry out experiments. There are 4 figures, 2 tables, and 7 references, 5 of which are Soviet.

SUBMITTED: June 14, 1958

AUTHORS: Tret'yakov, Ye.F., Grishuk, G. I., Gol'din, L. L. 56-34-4-4/60

TITLE: The Investigation of the Lower Excited Levels of U^{235} on the Basis of the Electrons of the Internal Conversion (Izucheniye nizhnikh vozbuzhdennykh urovney U^{235} po elektronam vnutrenney konversii)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol. 34, Nr 4, pp. 811 - 819 (USSR)

ABSTRACT: This work investigates the electrons of the internal conversion which are emitted from U^{235}-nuclei subsequent to the α-decay of Pu^{239}-nuclei. In the introduction a short report is given on previous papers dealing with the same subject. These internal conversion electrons were examined by a large iron-free β-spectrometer with a toroidal magnetic field. The first paragraph reports very shortly on the experimental technique. The authors investigated the conversion spectrum of the U^{235} up to electron energies of 350 keV, but conversion lines with an energy which considerably surmounts the background were found only in the

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range from 0 - 105 keV. Three different diagrams illustrate the ranges of the conversion spectrum for 0 - 35 keV, 35 - 52 keV, 52 - 105 keV. The energies of the electrons and the intensities of the conversion lines are compiled in a table. First the authors report on the levels I and II (13,0 and 51,7 keV). These two levels I and II are to be regarded as the first excited levels of the rotation band with K = 1/2. According to this interpretation the levels 0, I and II must possess the spins 1/2, 3/2 and 5/2 as well as the same parity. Almost all conversion lines which belong to the transitions II-0, II - I and I - 0 clearly show up in the spectrum. The authors also determined the multipole properties of these γ-transitions. The level 83,8 keV is the third excited rotation level of the band with K = 1/2. On this occasion the spin must be equal to 7/2 and the parity must agree with the parity of the remaining levels of the same band. The authors found only one transition starting from this level, the transition III - I with the energy 70,8 $\pm$ 0,2 keV. Remarkable is also the absence of the transition III - 0. From the level IV (149,7 keV) transitions start, which is discussed in

greater detail. From the level V (172,6 keV) some weak conversion lines start. This level seems to have the spin 7/2. Finally a short report is given on level VI with the energy 234 keV. The authors also looked for the electrons of an isomeric transition, but without success. The Pu^{240}-admixture in the investigated samples allowed also the investigation of the conversion electrons emitted from its daughter-substance U^{236}. The results of this work show without doubt that the levels 0,I,II,III and IV of U^{235} belong to the rotation band with $K = 1/2$. The investigation of the α-spectrum of Pu^{239} speaks for the existence of a whole series of higher excited levels of U^{235}, but the electromagnetic transitions between these levels cannot be observed. At the end the authors thank L.N.Kondrat'yev, I.I.Agapkin and G.Chernov for their assistance in the measurements, and L.A.Sliv for the information on the internal conversion coefficients on the L-shell. There are 4 figures, 2 tables, and 13 references, 4 of which are Soviet.

SUBMITTED: November 15, 1957

1. Alpha particles--Decay 2. Uranium--Production 3. Beta particles--Detection

AZARENKO, B.S., kand. tekhn. nauk; AFANAS'YEV, V.D., kand. tekhn. nauk; BROVMAN, M.Ya., inzh.; VAVILOV, M.P., inzh.; VERNIK, A.B., inzh.; GOLUBKOV, K.A.; GUBKIN, S.I., akademik [deceased]; GUREVICH, A.Ye., inzh.; DAVYDOV, V.I., kand. tekhn. nauk; DROZD, V.G., inzh.; YERMOLAYEV, N.F., inzh.; ZHUKEVICH-STOSHA, Ye.A., inzh.; KIRILIN, N.M., kand. tekhn. nauk; KOVYNEV, M.V., inzh.; KOGOS, A.M., inzh.; KOROLEV, A.A., prof.; KUGAYENKO, M.Ye., inzh.; LASKIN, A.V., inzh.; LEVITANSKIY, B.A., inzh.; LUGOVSKIY, V.M., inzh.; MEYEROVICH, I.M., kand. tekhn. nauk; OVCHAROV, M.S., inzh.; PASTERNAK, V.I., inzh.; PERLIN, I.L., doktor tekhn. nauk; POBEDIN, I.S., kand. tekhn. nauk; ROKOTYAN, Ye.S., doktor tekhn. nauk; SAF'YAN, M.M., kand. tekhn. nauk; SMIRNOV, V.V., kand. tekhn. nauk; SMIRNOV, V.S.; SOKOLOVSKIY, O.P., inzh.; SOLOV'YEV, O.P., inzh.; SIDORKEVICH, M.A., inzh.; TRET'YAKOV, Ye.M., inzh.; TRISHEVSKIY, I.S., kand. tekhn. nauk; KHEMKIN, G.N., inzh.; TSELIKOV, A.I.; GOROBINCHENKO, V.M., red. izd-va; GOLUBCHIK, R.M., red. izd-va; RYMOV, V.A., red. izd-va; DOBUZHINSKAYA, L.V., tekhn. red.

[Rolling; a handbook] Prokatnoe proizvodstvo; spravochnik. Pod red. E.S.Rokotian. Moskva, Metallurgizdat. Vol.1. 1962. 743 p. (MIRA 15:4)

1. Akademiya nauk BSSR (for Gubkin). 2. Chlen-korrespondent Akademii nauk SSSR (for Smirnov, TSelikov).
(Rolling (Metalwor))—Handbooks, manuals, etc.)

KOLOS, V.I.; TRET'YAKOV, Ye.M.

Determining the thicknessof a solidified layer. Kuz.-shtam. proizv. 5 no.2:47-49 F '63. (MIRA 16:2)
(Thickness measurement)

TRET'YAKOV, Ye.M.

Friction in supsetting with an effect of hardening. Kuz.-shtam. proizv. 5 no.3:5-10 Mr '63. (MIRA 16:4)
(Forging) (Friction)

TRET'YAKOV, Yu.D.; KACHANOV, I.N.

Isothermal solubility diagram for the quaternary system $FeSO_4 \cdot (NH_4)_2SO_4$-$MgSO_4$-$MnSO_4 \cdot (NH_4)_2SO_4$-$ZnSO_4 \cdot (NH_4)_2SO_4$-$H_2O$ at 40°C. Zhur.neorg.khim. 7 no.7:1708-1715 Jl '62. (MIRA 16:3)
(Systems (Chemistry)) (Solubility) (Sulfates)

PERELYGIN, V.P.; TRET'YAKOVA, S.P.; SARANTSEVA, V.R., tekhn. red.

[Half-life of a spontaneously fissionable isomer] Period poluraspada spontanno deliashchegosia izomera. Dubna, Ob"edinennyi in-t iadernykh issledovanii, 1963. 6 p.
(MIRA 16:6)

(Isomers) (Nuclear fission)

TRET'YAKOV, Ye. M.

PHASE I BOOK EXPLOITATION SOV/5025

Akademiya nauk SSSR. Institut mashinovedeniya

Issledovaniya v oblasti obrabotki metallov davleniyem (Investigations in the Field of Metal Pressworking) Moscow, Izd-vo AN SSSR, 1960. 66 p. Errata slip inserted. 4,200 copies printed.

Resp. Ed.: A.D.Tomlenov; Ed. Of Publishing House: G.Ye. Pevzner; Tech. Ed.: S.P. Golub'.

PURPOSE: This collection of articles is intended for engineers, designers, and scientific research workers engaged in the plastic working of metals.

COVERAGE: Articles of the collection deal with the following problems: tensile stresses in metal during forging and cross-rolling; deformation of a membrane in bulging by hydraulic pressure; intensification of plastic deformation in stamping contact area under the state of stress in helical cross-rolling on a three-roll mill; testing of sheet steel for biaxial tension by the method of bulging a membrane under hydraulic pressure; deformability of sheet steel; determination of the quality of industrial lubricants used in the cold stamping of sheet steel; determination of the quality of carbon sheet steel; and the temperature field of a blank in the hot stamping of steel plates. No personalities are mentioned. Each article contains conclusions based on investigations. References, predominantly Soviet, accompany most of the articles.

TABLE OF CONTENTS:

AVAILABLE: Library of Congress

Card 3/3

VK/wrs/gmp
5-1-61

S/122/61/000/007/005/007
D209/D304

AUTHORS: Tselikov, A.I., Lugovoskoy, V.M., and Tret'yakov, Ye.M.

TITLE: Basic theory of diametrical rolling and cold rolling using two and three roller mills

PERIODICAL: Vestnik mashinostroyeniya, v 41, no. 7, 1961, 49 - 54

TEXT: The authors elaborate the problem of using three roller mills as opposed to two roller mills, for the cold rolling of metals. This method, they claim, can be used for the manufacture of cylindrical objects with diameters ranging from 18 to 20 mm, giving a very low surface impurity product. The authors make the following assumptions: The contact between the cylindrical work piece and the rollers takes place along a straight line, or in other words, the resultant displacement is the sum of the elementary rotations through an infinitely small angle. The plastic deformation of the material is shown in Fig. 1. The authors first consider rolling by using only two rollers, and then Fig. 1 will consist of a num-

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Basic theory of diametrical ...

ber of triangles representing thevarious zones of plastic deformation due to the pressure exerted on the work piece. They state that these zones of plastic deformation must satisfy the kinematic conditions existing at the boundaries of the plastic deformation zone. This approach is recommended by the authors since it gives the upper limit of the pressure at the contact points, as opposed to the static consideration of loading which would only give the lower limit. They consider the equilibrium of the right hand portion of Fig. 1 to obtain an expression for the contact pressure. In the case of rolling with three rollers, and for section I-I

$$\sigma_y = 2k\left[-\frac{\eta\sqrt{3}+2}{\eta\sqrt{3}}\left(1{,}08\left|\ln\frac{2}{\eta\sqrt{3}+2}\right|-\right.\right. \qquad (21)$$

$$\left.\left.-0{,}02\right)+1{,}3\sqrt{\eta\sqrt{2}-0{,}1}+0{,}26\right]. \qquad (21)$$

holds, where σ_y - the pressure in I-I; k - plastic constant and $\eta = 2r/b$ (b = height of contact). To utilize the equations obtai-

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ned, the area of contact has to be calculated. In the case of hot rolling this is given by

$$b = \sqrt{\frac{2Rr}{R + r}\,\Delta r},$$

where R - roller radius, r - radius of the work piece and Δr deformation due to rolling. It is not valid for the cold rolling of metals because it does not take into account the elastic deformation taking place between the rollers and the metal. Therefore, to obtain a value for B, Fig. 4 is used to illustrate the zones of deformation. Δ_1 and Δ_2 are the local radial elastic deformations of the roller and work piece respectively. In order that the work piece be compressed by an amount Δ_r its center O_1 must move to position O_2 by a distance equal to $\Delta_1 + \Delta_2$.

$$b = b_1 + b_2 = \sqrt{\frac{2Rr}{R + r}\,\Delta r + b_2 + b_2} \qquad (24)$$

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gives the resultant length of contact taking into account elastic deformation. If the absence in symmetry is neglected

$$b_2 \approx \sqrt{4q(k_1 + k_2 \frac{Rr}{R + r}} \qquad (25)$$

applies, where q is the pressure per unit length of the cylinder, and k_1, k_2 are constants, depending on the material of the work piece and roller. $q = 2b_2p$ shows the relationship between p and q. By putting this value of q in Eq. (25)

$$b_2 \approx 8(k_1 + k_2) \frac{Rr}{R + r} p \qquad (26)$$

is obtained. The formation of cavities in the center of the cylinder could be attributed to the very large stresses developing at the boundaries of the plastic regions. Also

$$\sigma_y = 2k\left(\ln \frac{\eta_r}{\eta_0} - \frac{1}{\eta_0} + 1\right), \qquad (19)$$

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shows that the maximum tensile stresses occur at the center of the work piece. When using three rollers a cavity of diameter A (Fig. 2) is formed. The authors emphasize that that annular compression reduces the possibility of cavity formation in the center of the work piece, and, if enough tension is developed in the work piece, failure does not occur. Peeling is a great disadvantage of the cold rolling process, and this could be eliminated by using work pieces with smooth surfaces. This method was successful when using steel types 20, 45, UFX (ShKh)9, ShKh15, Y(U)12 and U8. The maximum surface area reduction was 75 %. Cold rolling greatly increases the strength of metals. The percentage reduction in surface area and are the yield stress of steels ShKh9 and U8. There are 10 figures, and 9 references: 8 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: S. Jonson Identation and Forging and Action of Nasmith Anvil, "The Engineer", 1958, v. 205, N5328.

Card 5/6

TOMLENOV, A.D.; TRET'YAKOV, Ye.M., red.; SIROTIN, A.I., red.izd-va; SMIRNOVA, G.V., tekhn. red.

[Mechanics of metal-shaping processes] Mekhanika protsessov obrabotki metallov davleniem. Moskva, Mashgiz, 1963. 234 p. (MIRA 16:12)
(Plasticity) (Sheet-metal work) (Forging)

S/182/62/000/005/005/007
D038/D113

AUTHOR: Tret'yakov, Yc. M.

TITLE: The effect of temper rolling on the mechanical properties of sheet steel

PERIODICAL: Kuznechno-shtampovochnoye proizvodstvo, no. 5, 1962, 20-23

TEXT: To improve mechanical properties and prevent the formation of slip bands in the stress strain diagram of parts extruded from 0.3-2.0 mm thick sheet steel, the steel must be temper rolled. The distribution of deformation along the thickness of a temper rolled sheet is given as:

$$\varepsilon_i = \frac{2}{\sqrt{3}} \sqrt{\frac{\Delta H}{H^2 - 4m^2 z^2}}, \qquad (12)$$

where H is the thickness. Experimental investigations demonstrated that (1) the correlation of plasticity with hardening was sufficiently accurate under single and compound loads in tests for uniaxial tension or compression; (2) the condition of plasticity permitted determining variations in the mechanical properties of a strip after temper rolling; and (3) the tension intensity could be determined from

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The effect of temper rolling on ... S/182/62/000/005/005/007
D038/D113

(a) the diagram of uniaxial tension and (b) the stress strain diagram. It is important to determine the residual stresses in a temper rolled sheet as they affect the nature of the stressed state of the part during extrusion, and may buckle it later on. It is pointed out that E.J. Paliwoda and I.I. Bessen (Metallurgical Society Conference, vol. 6, Chicago, 1960) had wrongly assumed that the symbol of residual stresses agrees with the deformation symbol. Formulas for determining the factors of residual stresses during flat deformation of a strip are given. There are 4 figures.

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TRET'YAKOV, Ye.M.

Effect of temper rolling on the mechanical properties of sheet steel. Kuz.-shtam. proizv. 4 no.5:20-23 My '62. (MIRA 16:5)
(Metals--Finishing) (Drawing (Metalwork))

L 42305-66 EWT(d)/EWT(m)/EWP(w)/T/EWP(t)/ETI/EWP(k) IJP(c) JD/HW/EM

ACC NR: AP6016308 SOURCE CODE: UR/0380/66/000/001/0107/0119

AUTHOR: Tret'yakov, Ye. M. (Moscow); Yelenev, S. A. (Moscow)

ORG: none

TITLE: Analysis of the process of plastic compression of thin billet of hardened material

SOURCE: Mashinovedeniye, no. 1, 1966, 107-119

TOPIC TAGS: metal hardening, compressive stress, solid mechanical property, creep, metal deformation

ABSTRACT: For many hardened materials, in the presence of intensive stresses which exceed the creep limits, the plastic conditions are well approximated by an exponential relationship of the following form:

$$\sigma_i = C\varepsilon_i^n, \qquad (1)$$

where C and n are parameters characterizing the mechanical properties of the deformed metal. A figure shows the effect of a change in n on the character of the above relationship. The article proceeds to an extended mathematical treatment of the subject, ending with the derivation of a formula permitting the numerical determination of the contact friction with respect to the intensity of the stresses at the center and at the

Card 1/2 UDC: 539.374

L 42305-66

ACC NR: AP6016308

edge of a metal band. Orig. art. has: 31 formulas, 3 figures and 4 tables.

SUB CODE: 11,20/SUBM DATE: 09Jun65/ ORIG REF: 007/ OTH REF: 002

Card 2/2

TRET'YAKOV, Ye.V., kand.tekhn.nauk; GUBAR', V.F.

Consumption of the metal charge in the production of steel at metallurgical plants in the Ukrainian S.S.R. Metall. gornorud. prom. no.6:[illegible]
N-D '63. (MIRA [illegible])

TRET'YAKOV, Ye.V., kand.tekhn.nauk

Research by the Donetsk Branch of the Ukrainian Research Institute of Metals. Stal' 22 no.7:605,621 Jl '62. (MIRA 15:7)
(Steel--Metallurgy)

LEVUSHKIN, S.I.; TRET'YAKOV, Ye.V.

Summer studies of the karst group of the Laboratory of Hydrogeologic Problems of the Caucasus in 1960. Nov.kar.i spel. no.2:97 '61. (MIRA 15:9)

(Caucasus—Karst)

S/133/62/000/007/001/014
A054/A127

AUTHOR: Tret'yakov, Ye.V.; Candidate of Technical Sciences

TITLE: At the Donetskiy filial Ukrainskogo nauchno-issledovatel'skogo instituta metallov (Donets Branch of the Ukrainian Scientific Research Institute of Metals)

PERIODICAL: Stal', no. 7, 1962, 605

TEXT: The properties of zirconium-modified carbon steel grade 15 and 20 were investigated. The tests were carried out in a 200-kg induction furnace with the addition of ferro-zirconium foundry alloy containing 25 - 35% Zr. When the foundry alloy was added to the ladle bottom, 47.5% of zirconium was adapted, whereas when it was added to the flow or the furnace, the figures were only 20.9 and 1 .6%, respectively. Zirconium considerably affects the crystallization of the steel, its grain size, the zone of acicular crystals. The number and dimensions of oxide inclusions were reduced and the composition, shape and distribution of nonmetallic inclusions changed as well. With a zirconium content of 0.10 - 0.11% ZrO_2 inclusions are formed and distributed uniformly, while the

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At [illegible] Donetskiy filial ....

amount of corundum inclusions decreases. Upon adding zirconium in amounts of 0.05 - 0.42% the basic strength and plastic properties of low-carbon steels did not change. The threshold of cold brittleness was lowered, the corrosion resistance in water increased by a factor of 1.5 - 2. The total weight loss for steel grades containing 0.11 - 0.42% Zr amounted to 1.24 - 1.58 g after being tested for 500 h, while the corresponding values for control samples (without Zr) were 2.36 - 2.981 g.

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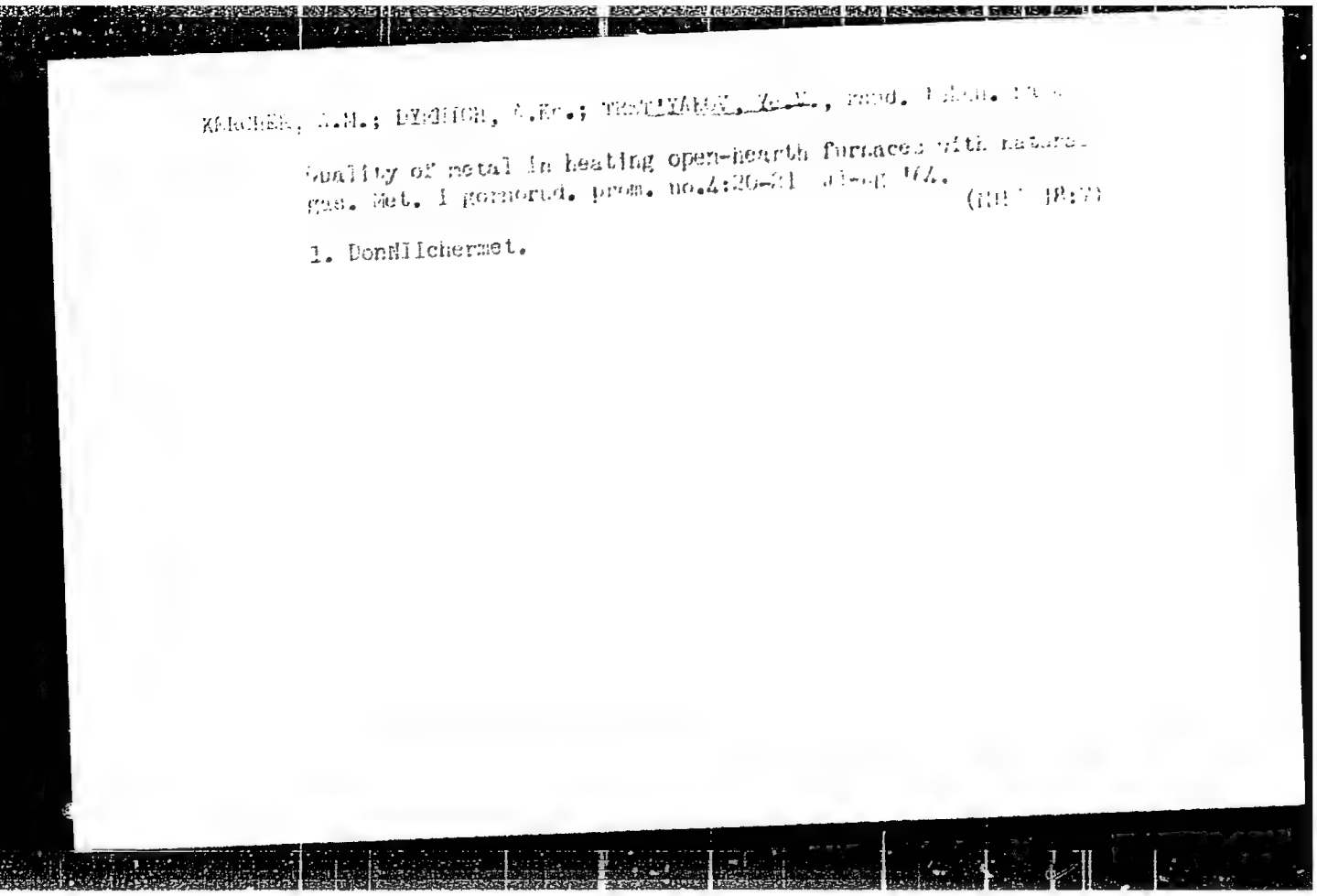
BRONSHTEYN, Vladimir Markovich; TRET'YAKOV, Ye.V., red.; LEBEDEV, A.I., red.izd-va; ISLENT'YEVA, P.G., tekhn.red.

[Reduction of waste in steel smelting] Snizhenie braka v staleplavil'nom proizvodstve. Moskva, Gos.nauchno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1959. 140 p. (MIRA 12:9)

(Steel--Metallurgy)
(Metallurgical plants--Quality control)



KAlachek, A.N.; LYADOV, A.Ye.; TSVETKOV, Ye.V., red. [illegible]

Quality of metal in heating open-hearth furnaces with natural gas. Met. i koksokhim. resp. no.4:20-21 [illegible] '64. (MIR 18:7)

1. DonNIIchermet.

GONCHARENKO, N.I., kand. tekhn. nauk; BABIY, A.S.; BAYDUK, V.F.; BAZILEVSKIY, A.R.; MISHCHENKO, N.M.; MALINOVSKIY, V.G.; NELEPA, V.I.; TOL'SKIY, A.A.; TRET'YAKOV, Ye.V., kand. tekhn. nauk; KHALIF, M.L.; PODOPRIGORA, I.D.

Smelting of steel in oxygen- and steam-blown converters with an acid lining. Met. i gornorud. prom. no.4:20-25 Jl-Ag '65. (MIRA 18:10)

KULIKOV, V.O.; BORNATSKIY, I.I.; ZARUBIN, N.G.; DOROFEYEV, G.A.; KALUZHSKIY, Ye.A.; KAZAKOV, A.A.; KOVAL', R.F.; KORNEVA, N.K.; TRET'YAKOV, Ye.V.; TRUNOV, Ye.A.; Prinimali uchastiye: ANDREYEV, V.L.; GORDIYENKO, V.V.; GRINEVICH, I.P.; GUBAR', V.F.; DOLINENKO, V.I.; ZHERNOVSKIY, V.S.; ZHIGALOVA, Z.I.; KOMOV, N.G.; KURA'IN, B.S.; OLESHKEVICH, T.I.; PRIKHOZHENKO, Ye.

Mastering the operations of 650- and 900-ton (mega - gram) capacity open-hearth furnaces at the Il'ich metallurgical plant. Stal' 25 no.8:805-807 S '65. (MIRA 18:9)

1. DONNIICHERMET i Zhdanovskiy metallurgicheskiy zavod imeni Il'icha.

TRET'YAKOV, Ye.V., inzh.; OYKS, G.N., prof., doktor tekhn.nauk

Conditions for accelerating slag formation and dephosphorization.
Izv.vys.ucheb.zav.; chern.met. no.8:21-30 Ag '58. (MIRA 11:11)

1. Moskovskiy institut stali.
(Smelting) (Chemistry, Metallurgic)

ROMASHKOVTSEV, Grigoriy Savvich; TRET'YAKOV, Ye.V., red.; ROZENTSVEYG, Ya.D., red.izd-va; DOBUZHINSKAYA, L.V., tekhn.red.

[Inspector of the technical control division of an open-hearth process] Kontroler OTK martenovskogo tsekha. Moskva, Gos. nauchno-tekhn.izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1959. 214 p. (MIRA 12:4)

(Open-hearth process)

THET'YAKOV, Ye.V.; SHNEYEROV, Ya.A.; KOTIN, A.G.

Using fluxed briquets and sinter cakes in open-hearth furnaces. (MIRA 11:5)
Biul. TSNIICHM no.4:6-12 '58.
(Open-hearth process)

SOV/133-59-5-6/31

AUTHORS: Derfel', A.G., Dubina, Yu.G., Kotin, A.G., Myshonkov, N.I., Sologub, S.L., Tret'yakov, Ye.V., Khmirov, V.I., Chernenko, F.A. and Shneyerov, Ya.A.

TITLE: Efficiency of the Use of Sinter and Briquettes Instead of Ore and Limestone in Open-hearth Furnaces (Effektivnost' primeneniya v martenovskikh pechakh aglomerata i briketov vzamen rudy i izvestnyaka)

PERIODICAL: Stal', 1959, Nr 5, pp 400 - 407 (USSR)

ABSTRACT: In order to compare the efficiency of using fluxed sinter and ore-lime briquettes instead of ore and limestone in open-hearth furnaces as well as to determine the optimum composition of the above agglomerated materials, experimental heats were carried out in 370-ton open-hearth furnaces at the imeni Dzerzhinskiy Works during 1957-1958. Altogether 63 heats with briquettes, 76 with sinters of various compositions and 90 comparative heats using ore and limestone were made. All heats were made in the same furnaces and during the same periods. The composition of briquettes and sinters tested is given in Table 1 (basicity of briquettes varied from 0 - 5.4 and of

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sinters from 0.4 to 2.2). Changes in the basicity ... shown FeO content in slag in the course of smelting are shown in Figures 1 and 2, respectively, the main indices of the experimental and comparative heats in Table 2, the comparison of the amounts of CaO, SiO_2 and ΣFeO transferred to slag from various granular materials - Table 3, changes in the SiO_2 content of slag in the course of smelting for various heats - Figures 3 and 8, the same changes in slag basicity - Figure 4, the same changes in the P_2O_5 content - Figures 5 and 9, the same changes in the CaO content - Figure 6, the same changes in the ΣFeO and CaO and ΣFeO contents - Figures 7 and 11, the same changes in the content of sulphur - Figure 10. It was found that the use of fluxed briquettes or sinters instead of ore and limestone leads to a considerably faster formation of slag during the melting down period, to an earlier slag removal and to a corresponding decrease in the melting

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period. The use of fluxed briquettes or sinter of a basicity 2.0 - 2.5 without additions or with minimal additions of ore and limestone made it possible: 1) to decrease the melting period in 370-ton furnaces by 40-45 min with an increase in the furnace productivity of 6-7%; 2) to decrease the duration of heating up successive layers of granular materials during the charging period as well as their heating after the charging is completed (which permitted a further decrease of 10-15 min in the duration of heats); 3) to increase slag basicity in the course of smelting and to decrease the FeO content of slag at the beginning of the melting period and to increase its FeO content at the end of this period; 4) to increase the dephosphorising and desulphurising ability of slag due to its earlier formation and higher basicity throughout the whole course of smelting and 5) to exclude blow-outs from the furnace during melting. The briquettes and sinters can also be used with success during refining. The organisation of a large-scale

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production of fluxed briquettes and sinters for the open-hearth furnaces and their wide application in steel-making practice is recommended. There are 11 figures, 3 tables and 6 Soviet references.

ASSOCIATIONS: Ukrainskiy institut metallov (Ukrainian Institute of Metals) and Zavod imeni Dzerzhinskogo (imeni Dzerzhinskiy Works)

Card 4/4

TRET'YAKOV, Y.V., Cand Tech Sci -- (diss) "Methods of accelerating smelting and slag formation in the scrap-ore open-hearth process." Mos, 1958. 1? pp, incl cover with tables. (Min of Higher Education USSR. Mos Order of Labor Red Banner Inst of Steel im I.V. Stalin), 120 copies (KL, 49-58, 125)

— 20 —

TRET'YAKOV, YE. V.

TRET'YAKOV, YE.V., inzhener; MAKOVSKIY, V.A., inzhener.

Reduction of high phosphorus pig iron in tilting open hearth furnaces. Stal' 17 no.6:517-519 Je '57. (MIRA 10:7)

1. Zavod "Azovstal'".
(Open hearth furnaces) (Iron phosphides--Metallurgy)

SHNEYEROV, Ya.A., kand.tekhn.nauk; DERFEL', A.G., kand.tekhn.nauk; KOTIN, A.G., kand.tekhn.nauk; Prinimali uchastiye: ZAYTSEV, I.A.; KURAPIN, B.S.; LEVITASOV, Ya.M.; SUKACHEV, A.I.; TRET'YAKOV, Ye.V.; UMNOV, V.D.; SHUKSTUL'SKIY, I.B.

Reducing the consumption of ferromanganese in the making of open-hearth steel. Trudy Ukr. nauch.-issl. inst. met. no.7:103-114 '61. (MIRA 14:11)

(Steel--Metallurgy) (Ferromanganese)

TRET'YAKOV, Ya.V., kand. tekhn. nauk; KOVALENKO, V.S., inzh.; CHUMACHENKO, V.S., inzh.; KISELEV, I.M., inzh.

Using compacted addition alloys in the production of low carbon steel with zirconium. Met. i gornorud. prom. no.6:29-30 N-D '62. (MIRA 17:8)

1. Trest "Donbasstsvetmet" (for Tret'yakov, Kovalenko).
2. Donetskiy filial Ukrainskogo nauchno-issledovatel'skogo instituta metallov (for Chumachenko, Kiselev).

POLYAK, Isaak Berkovich; TRET'YAKOV, Yevgeniy Vasil'yevich; LANOVSKAYA, M.R., red. izd-va; MIKHAYLOVA, V.V., tekhn. red.

[Open-hearth production of steel] Martenovskoe proizvodstvo stali. Moskva, Metallurgizdat, 1963. 161 p. (MIRA 16:6)
(Steel--Metallurgy) (Open-hearth process)

PHASE I BOOK EXPLOITATION SOV/4893

Vsesoyuznoye soveshchaniye po fizike, fiziko-khimicheskim svoystvam ferritov i fizicheskim osnovam ikh primeneniya. 3d, Minsk, 1959

Ferrity; fizicheskiye i fiziko-khimicheskiye svoystva. Doklady (Ferrites; Physical and Physicochemical Properties. Reports) Minsk, Izd-vo AN BSSR, 1960. 655 p. Errata slip inserted. 4,000 copies printed.

Sponsoring Agencies: Nauchnyy sovet po magnetizmu AN SSSR. Otdel fiziki tverdogo tela i poluprovodnikov AN BSSR.

Editorial Board: Resp. Ed.: N. N. Sirota, Academician of the Academy of Sciences BSSR; K. P. Belov, Professor; Ye. I. Kondorskiy, Professor; K. M. Polivanov, Professor; R. V. Telesnin, Professor; G. A. Smolenskiy, Professor; N. N. Shol'ts, Candidate of Physical and Mathematical Sciences; E. M. Smolyarenko; and L. A. Bashkirov; Ed. of Publishing House: S. Kholyavskiy; Tech. Ed.: I. Volokhanovich.

PURPOSE: This book is intended for physicists, physical chemists, radio electronics engineers, and technical personnel engaged in the production and use of ferromagnetic materials. It may also be used by students in advanced courses in radio electronics, physics, and physical chemistry.

COVERAGE: The book contains reports presented at the Third All-Union Conference on Ferrites held in Minsk, Belorussian SSR. The reports deal with magnetic transformations, electrical and galvanomagnetic properties of ferrites, studies of the growth of ferrite single crystals, problems in the chemical and physicochemical analysis of ferrites, studies of ferrites having rectangular hysteresis loops and multicomponent ferrite systems exhibiting spontaneous rectangularity, problems in magnetic attraction, highly coercive ferrites, magnetic spectroscopy, ferromagnetic resonance, magneto-optics, physical principles of using ferrite components in electrical circuits, anisotropy of electrical and magnetic properties, etc. The Committee on Magnetism, AS USSR (S. V. Vonsovskiy, Chairman) organized the conference. References accompany individual articles.

Ferrites (Cont.) SOV/4893

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"Investigation of the Structural Transformations of Certain Magnetic Alloys by the Method of the Real Heat Capacity," Moscow, 1958. (Dissertation presented and approved for the degree of Cand. Chem. Sci.) Moscow State Univ. im M. V. Lomonosov.

5(4)

AUTHORS: Tret'yakov, Yu. D., Khomyakov, K. G. SOV/78-4-3-23/34

TITLE: Specific Heat of the Alloys FeNiAl and FeCoAl (Teployemkost' splavov FeNiAl i FeCoAl)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 3, pp 645-650 (USSR)

ABSTRACT: The true specific heat of the alloys FeNiAl and FeCoAl was investigated according to various methods of treatment of the alloys. For the production of the alloys electrolytic cobalt, nickel, Armco iron, and aluminum with a purity of 99.99 % were used. The melting of the alloys was carried out in the high-frequency furnace in argon atmosphere. The alloys were investigated as to their true specific heat and coercive force H_c. The curves of specific heat c_p of one and the same sample were plotted in softened state and after hardening at 800 and 1,250° and are shown in figures 1 and 2. The course of the c_p curve of the alloy FeCoAl shows a maximum at 700° and of the alloy FeNiAl at 730-735°. The coercive force of the softened alloys amounts in the case of FeCoAl to 250 oe and in the case of FeNiAl to 75 oe.

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In hardened alloys at 800° the H_c of FeCoAl ~1 oe and of FeNiAl = 63 oe. The c_p course in hardened samples (800°) is characterized by the occurrence of exothermic effects at low temperatures. The c_p course in samples hardened at 1,250° proceeds in a similar way. The limit of the exothermic effect is in the case of the alloy FeNiAl between 300-600° with a c_p minimum at 460° and in the case of FeCoAl at 400-640° and a c_p minimum at 560°. The nature of the exothermic effect at 300-640° could not clearly be determined, it is presumably based upon the orientation of the β and β_2 phase with a variation of the structural tension in the alloy. Alloys hardened at 1,250° have also an exothermic effect at 640° and 680°. The considerable temperature effect increases the coercive force H_c. There is no dependence between high-temperature transformation and magnetic hardening of the Fe-Ni-Al alloys. It was found that in the system Fe-Co-Al the magnetic hardening process proceeds slowly.

At higher temperatures the c_p curve proceeds λ-shaped, independent of the thermal treatment of the alloys, with a maximum in FeCoAl at 700° and in FeNiAl at 730-735°. This variation in the c_p curve is connected with the occurrence of the magnetic transformation in the Curie point. There are 4 figures, 1 table, and 27 references, 19 of which are Soviet.

SUBMITTED: November 16, 1957

TRET'YAKOV

TRET'YAKOV, Yu. D., Cand Chem Sci—(diss) "Study of structural transformations of certain magnetic alloys by the method of true heat capacity." [illegible], 1959. 9 pp (Mos St te U im M.V. Lomonosov), 100 copies (KL,28-59,103)

-30-

S/078/61/006/004/018/018
B107/B218

54210 1043, 1273, 1145

AUTHOR: Tret'yakov, Yu. D.

TITLE: Isothermal solubility diagram of the quaternary system $MnSO_4(NH_4)_2SO_4 - MgSO_4(NH_4)_2SO_4 - FeSO_4(NH_4)_2SO_4 - H_2O$ at 40°C

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 6., no. 4, 1961, 985-993

TEXT: The data obtained by the present study of the system may be used for the production of Mg-Mn ferrites which are of great importance in pulse technique. Double salts of the schoenite type ($MgSO_4 \cdot K_2SO_4 \cdot 6H_2O$), where Mg may be replaced by Fe^{2+}, Co^{2+}, Mn^{2+}, Cu^{2+}, Cd^{2+}, and K^+ may be replaced by NH_4^+, are usually isomorphous and form uninterrupted series of mixed crystals. The initial substances were: $MgSO_4 \cdot 7H_2O$, chemically pure $(NH_4)_2SO_4$ and $MnSO_4$, synthetized from 99.95% electrolytic manganese. The method of "isothermal decrease of supersaturation" was used for establishing equilibrium between the liquid and the solid phase. It was developed by V. G. Khlopin et al. and has been used successfully by G. I. Gorshteyn.

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Isothermal solubility diagram of the...

By this method, equilibrium is established after a few hours, which distinguishes the method from others, e.g., the method of "recrystallization". The authors used a thermostat which enabled simultaneous experimenting with 24 samples. Fe was titrimetrically determined by $KMnO_4$. Mn was titrated as oxalate with $KMnO_4$. Mg was bromatometrically determined as oxyquinolate. The ternary system $MgSO_4 \cdot (NH_4)_2SO_4 - MnSO_4 \cdot (NH_4)_2SO_4 - H_2O$ was studied (Table 1). Apart from the different solubility of Mg and Mn salts, the system seems to be ideal over the entire range of concentrations of both components. The mean value of equilibrium distribution between Mg salt and Mn salt is 3.50. Based on the thermodynamic theory of activity (Ref. 3: G. I. Gorshteyn, N. I. Silant'yeva, Zh. obshch. khimii, 23, 1920, (1953)), the following holds for ideal ternary systems: $D_{(Fe/Mg)} = D_{(Fe/Mn)} = D_{(Mg/Mn)}$. In the present case, this condition is fully satisfied. Five inner cuts of the quaternary system were studied (Tables 2 and 3). For evaluating the solubility diagrams, no tetrahedral model was used, but the curves were treated mathematically in rectangular coordinates. The solubilities of the individual components were plotted

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on the axes x, y, z. The coordinate surfaces x-0-z, x-0-y, y-0-z correspond to the given ternary systems, and the total octant 0-x-y-z corresponds to the quaternary system. For any content of the solutions, the following equation must hold for the surface in the intercepts on the axis of coordinates: $x/a + y/b + z/c = 1$. a, b, and c are the solubilities of the individual salts, and x, y, z are the concentrations of the saturated solutions. Tables 2 and 3, column III, give the values for the sum $x/a + y/b + z/c$ of the compounds investigated. Since the values are nearly equal to 1, it is possible to prove that there really exists an uninterrupted series of mixed crystals in the quaternary system $FeSO_4 \cdot (NH_4)_2SO_4$ - $MnSO_4 \cdot (NH_4)_2SO_4$ - $MgSO_4(NH_4)_2SO_4$ - H_2O. It seems to be of special importance to establish an interrelation between the compositions of the liquid and solid phases, which enables quantitative calculations. The following relation holds for the relative concentration of the component A in the solid phase and in the mother lye: $D_{equ(A/B)} = \frac{y_A}{y_B} / \frac{x_A}{x_B}$.

Systems for which the value for D_{equ} remains constant are termed ideal

Isothermal solubility diagram of the...

systems. Their distribution curve assumes the form of a hyperbola following the equation: $y_A = \frac{D \cdot x_A}{1-x_A(1-D)}$. x_A and y_A denote the concentrations of the component A in the salt fraction of the mother lye and in the solid phase; D is the coefficient of equilibrium distribution of A as related to B. It seems possible to apply this coefficient also to quaternary systems. In this case, it holds: $D_{equ(A/B+C)} = \frac{y_A}{y_{(B+C)}} / \frac{x_A}{x_{(B+C)}}$. Tables 2 and 3 give experimental results. The ratio Mn-salt concentration/total concentration of Mn and Mg may be seen from column VI. The change of the distribution coefficient as a function of the composition of the solution is given by: $D_{(Mg/Fe+Mg)} = f\left(\frac{Mn}{Fe+Mn}\right)$ in the salt fraction of the mother lye. By using the method of least squares, the following values are obtained: $D_{(Fe/Mn+Mg)} = 0.633+0.0278x_1+1.389x_1^2$, and $D_{(Mg/Mn+Fe)} = 1.580-0.333x_2+1.963x_2^2$. x_1 is the ratio of concentrations of the salts Mn/Mn+Mg, and x_2 is the

Isothermal solubility diagram of the...

ratio of concentrations of the salts Mn/Mn+Fe. Thus, to a mother lye consisting of 25 % Mg salt, 25 % Mn salt, and 50 % Mohr's salt, corresponds a solid phase of 36.04 % Mg, 14.11 % Mn, and 49.85 % Mohr's salt. Any point of the solubility diagrams of the system $MgSO_4 \cdot (NH_4)_2SO_4$ - $MnSO_4 \cdot (NH_4)_2SO_4$ - $FeSO_4 \cdot (NH_4)_2SO_4$ - H_2O may be calculated analogously. There are 9 figures, 3 tables, and 9 references: 7 Soviet-bloc.

SUBMITTED: February 20, 1960

Card 5/13

PROTSENKO, P.I.; PROTSENKO, A.V.; TRET'YAKOV, Yu.D.; VENEROVSKAYA, L.N.

Electric conductance of binary molten nitrite-nitrate systems.
Dokl. AN SSSR 154 no.5:1171-1174 F'64. (MIRA 17:2)

1. Rostovskiy-na-Donu gosudarstvennyy universitet. Predstavleno akademikom A.N. Frumkinym.

KHOMYAKOV, K.G.; TRET'YAKOV, Yu.D.; REZNITSKIY, L.A.; PAVLOVA-VEREVKINA, L.A.

Works on ferrates at the general chemistry department over the last five years. Vest.Mosk.Un.Ser.2:Khim. 16 no.5:52-59 S-O '61. (MIRA 14:9)

1. Kafedra obshchey khimii Moskovskogo universiteta.
(Ferrates)

TRET'YAKOV, Yu.D.; KHOMYAKOV, K.G.

Structural changes in some magnetic alloys, as studied by the method of true heat capacity. Zhur.neorg.khim. 5 no.2:410-414 F '60. (MIRA 13:6)
(Magnetic materials) (Alloys) (Heat capacity)

ferrite-magnetic solid solutions

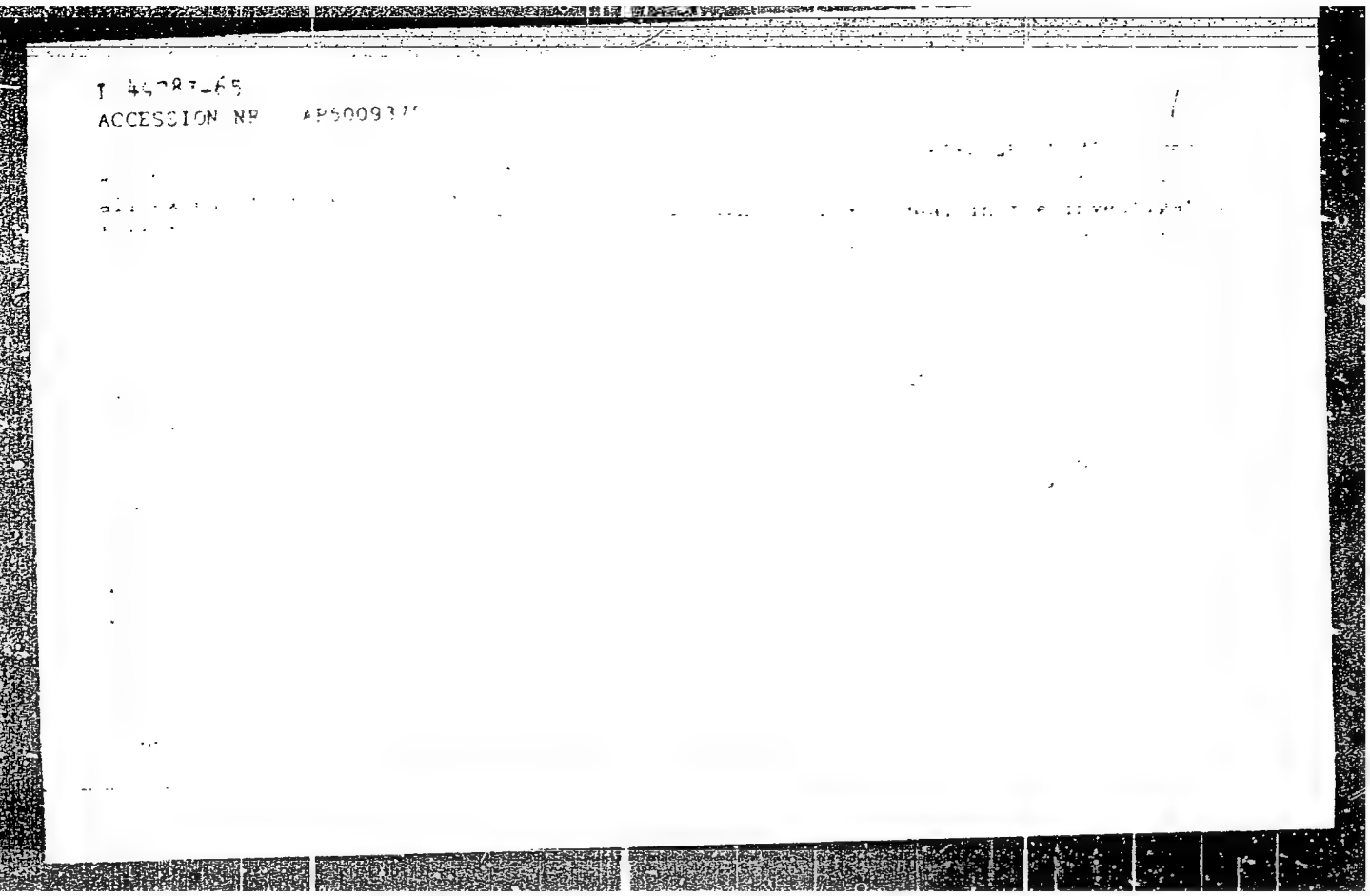
SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 2, 1965, 240-245

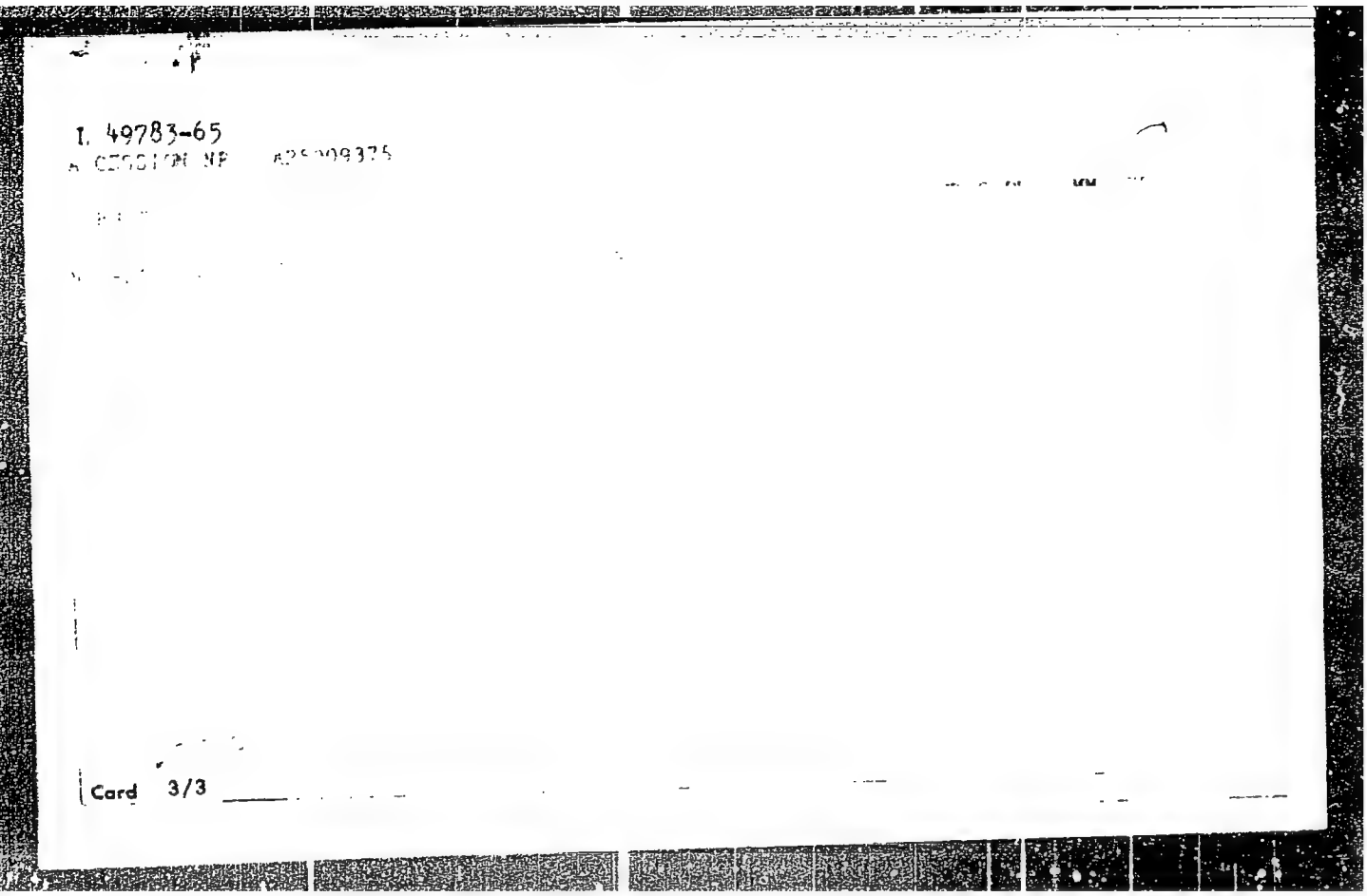
[redacted] magnetic, phase diagram, thermodynamics, solid solution

[redacted]

[redacted] can be measured [redacted]

complete [redacted]
region of the [redacted] diagram is described by





5(4), 18(4) SOV/78-4-1-3/48

AUTHORS: Tret'yakov, Yu. D., Khomyakov, K. G.

TITLE: The Specific Heat of the Intermetallic Compound CoAl After Various Thermal Treatments (Teployemkost' intermetallicheskogo soyedineniya CoAl posle razlichnykh termicheskikh obrabotok)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 1, pp 13-16 (USSR)

ABSTRACT: The real specific heat of the intermetallic compound CoAl of stoichiometric composition was investigated by the method of continuous adiabatic heating. For the production of the alloys CoAl electrolytically purest cobalt and aluminum (99.99%) were used. The real specific heat c_p was measured for the same sample in hardened and annealed state in dependence on temperature. The c_p value in the hardened samples rises slowly and shows a sudden rise at 740°. The sudden rise of the c_p value depends on the order and disorder in the CoAl structure. By hardening the samples at 1250° a greater disorder is caused than by hardening at 800°C. At temperatures above 800° all

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The Specific Heat of the Intermetallic Compound CoAl After Various Thermal Treatments

curves of the c_p value show a sudden drop. There are 2 figures and 13 references, 4 of which are Soviet.

SUBMITTED: October 7, 1957

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SOV/76-4-1-2/48

7(0), 24(8)

AUTHORS: Tret'yakov, Yu. D., Troshkina, V. A., Khomyakov, K. G.

TITLE: An Adiabatic Calorimeter Operating on the Principle of Continuous Heating (Adiabaticheskiy kalorimetr, rabotayushchiy po printsipu nepreryvnogo nagreva)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 1, pp 5-12 (USSR)

ABSTRACT: In order to investigate the structural change in magnetic alloys by the heat capacity method a new adiabatic calorimeter was constructed. The device is described in detail and the diagram shown in figures 1 and 2. The thermo-elements for the calorimetric system are indicated. By determining the real specific heat of cobalt and iron within long temperature ranges the calorimeter was tested. The specific heat c_p of cobalt changes suddenly within the temperature range 447-478°, iron shows a maximum of specific heat c_p within the temperature range 745-775° which corresponds to the transition from α-to β-phase. The c_p determination of cobalt was compared to data obtained

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An Adiabatic Calorimeter Operating on the Principle of Continuous Heating

from publications and it was found that the maximum error of the adiabatic calorimeter is ± 1% at a heating rate of 0.3 to 1.0°/min. Heat capacity up to 850° can be measured by means of the new calorimeter. There are 7 figures, 2 tables, and 10 references.

SUBMITTED: October 7, 1957

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68233

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S/078/60/005/02/027/045
B004/B006

AUTHORS: Tret'yakov, Yu. D., Khomyakov, K. G.

TITLE: Investigation of the Structural Changes in Various Magnetic Alloys by the Method of Real Specific Heat

PERIODICAL: Zhurnal neorganicheskoy khimii, 1960, Vol 5, Nr 2, pp 410-414 (USSR)

ABSTRACT: The authors investigated the industrial alloys ANKO-1 and ANKO-2. For ANKO-1, the authors found the approximate composition of 18% Ni, 10% Al, 12% Co, 6% Cu (rest: Fe), and for ANKO-2, 20% Ni, 9% Al, 15% Co, 4% Cu (rest: Fe). The authors determined the real specific heat c_p by continuous adiabatic heating in a calorimeter (Ref 11). The alloys were heated to 1250° in an argon atmosphere and then hardened in ice water. Hardening was controlled by measuring the coercivity H_c by the ballistic method. The values obtained for c_p are given in the figures 1,2, those of H_c are listed in a table. The findings were as follows: 1) tempering of hardened alloys at low temperatures is accompanied by an exothermic effect. 2) This effect is probably caused by the magnetic transformation of the weakly magnetic β_2-phase. On repeatedly heating the alloy, the effect

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Investigation of the Structural Changes in Various Magnetic Alloys by the Method of Real Specific Heat

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disappears, since meanwhile a separation of the β- and β_2-phase has occurred. 3) The exothermic effect occurring at 610 - 660° is caused by the magnetic hardening of the alloys, since it is accompanied by a sharp increase in H_c. The alloys ANKO-1 and ANKO-2 are distinguished from the alloy FeNiAl by their greater magnetic force. 4) The endothermic effect at 780° observed in the alloy ANKO-1 is probably due to the transformation at the Curie point. Similar effects were observed in FeCoAl (700°) and FeNiAl (735°). The transformation point of ANKO-2 is above 800° and thus beyond the range investigated. There are 2 figures, 1 table, and 12 references, 6 of which are Soviet.

SUBMITTED: October 26, 1958

Card 2/2

THET'YAKOV, Yu.D.; KHOMYAKOV, K.G.

Heat capacity of the alloys FeNiAl and FeCoAl. Zhur. neorg. khim. 4 no.3:645-650 Mr '59. (MIRA 12:5)
(Iron-nickel-aluminum alloys) (Iron-cobalt-aluminum alloys)
(Heat capacity)

TRET'YAKOV, Yu.D.; KHOMYAKOV, K.G.

Physicochemical properties of some ferrites obtained by different methods. Part 2: Solubility isotherms for the system $(NH_4)_2SO_4$ - $MnSO_4$ - $FeSO_4$ - $Fe_2(SO_4)_3$ - H_2O at 25, 40, and 55° C. Vest. Mosk. un. Ser. 2: Khim. 15 no.5:51-55 S-O '60. (MIRA 13:11)

1. Moskovskiy gosudarstvennyy universitet, kafedra obshchey khimii.
(Sulfates) (Ferrates)

S/078/62/007/006/003/024
B124/B138

AUTHORS: Tret'yakov, Yu. D., Khomyakov, K. G.

TITLE: Apparatus for measuring the dissociation pressure of ferrites and oxides at high temperatures

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 7, no. 6, 1962, 1219-1224

TEXT: The direct static method is best suited for measuring the dissociation pressure of ferrites between 10^{-2} mm Hg and 1 atm O_2 corresponding to a temperature variation between 1100 and 1500°C. The diagram of the apparatus (Fig. 1) and the heating system (Fig. 2) are described in detail. Before the experiment the gas in the system is removed by heating to 1500°C for 8 hrs until reaching a vacuum of 10^{-5} mm Hg. The airtightness of the system is checked by disconnecting the pump system and seeing that the vacuum must not fall below 10^{-3} mm Hg in one day. Complete expulsion of the gases adsorbed to the specimens was attained by 18 hr heating to 800°C. The specimen is heated to 1100°C and the

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Apparatus for measuring the ...

manometer is read every two minutes until the pressure does not rise any more. Equilibrium dissociation pressure is usually reached within 20-30 min. Then the furnace temperature is raised by 20-30°C, and the initial temperature is re-established after 5-10 min, while the pressures are noted. Measurements also are taken each 50°C up to 1500°C. The test substance is chemically pure Fe_2O_3 produced by thermal decomposition of Mohr's salt. In some cases analytically pure Fe_2O_3 has been used. The following relation holds for the dissociation pressure as a function of 1/T: $\log p_{O_2}$ (atm) = 23,330/T + 13.52; hence, for the reaction $(2/3)Fe_3O_4 + (1/6)O_2 \rightleftharpoons Fe_2O_3$ between 1100 and 1500°C, the formation heat $\Delta H = 17.80 \pm 0.20$ kcal/mole of Fe_2O_3, and the heat of formation of Fe_2O_3 from its elements $\Delta H = -191.8$ kcal/mole, which agrees very well with the published value (-192.5 kcal/mole). The change in free energy of the reaction $4Fe_3O_4 + O_2 \rightleftharpoons 6Fe_2O_3$ calculated as a function of temperature from the equation $\Delta Z^\circ = -4.575\ T \log K_A = -4.575\ T \log p_{O_2}$ is -106.200

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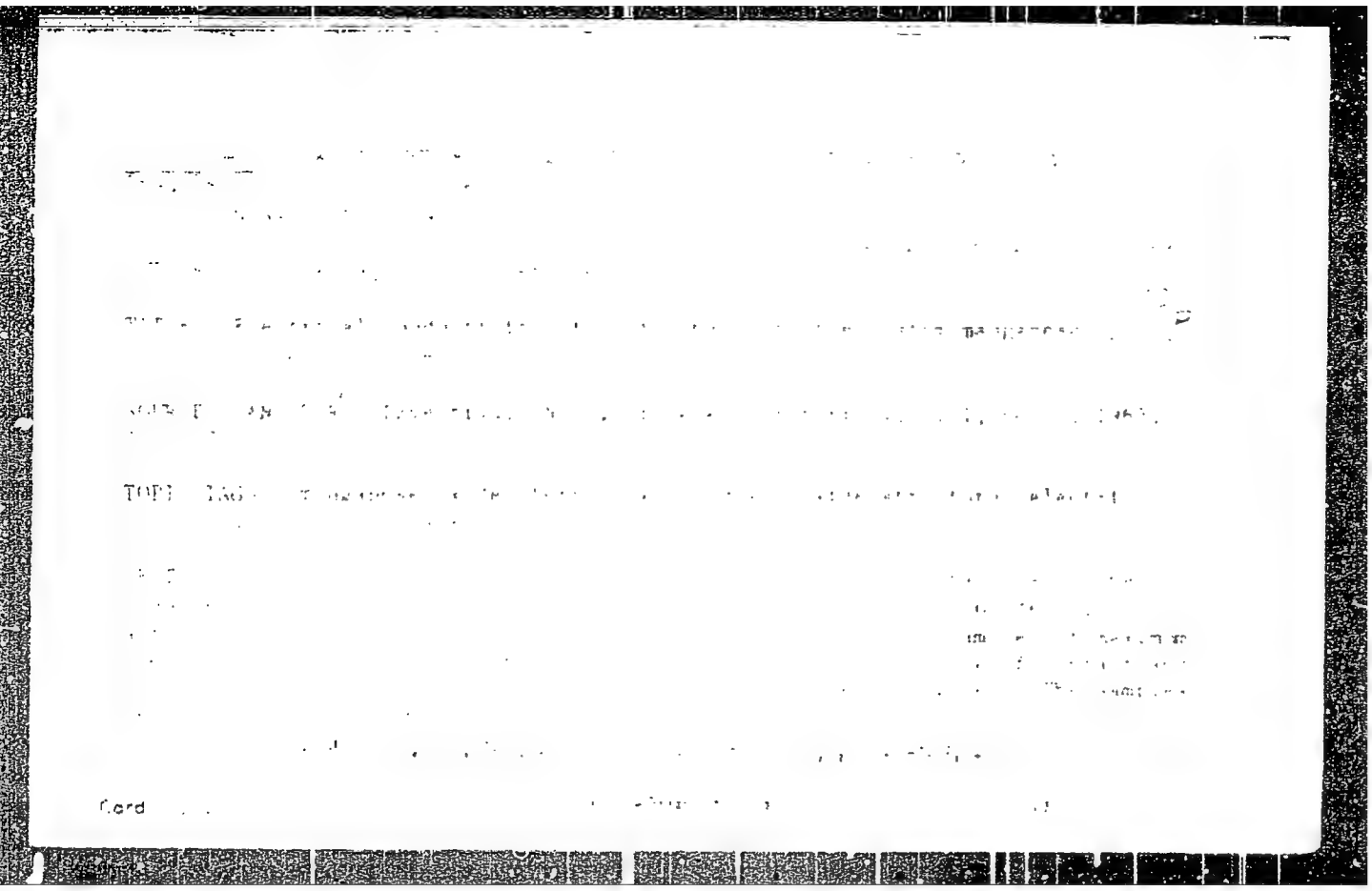
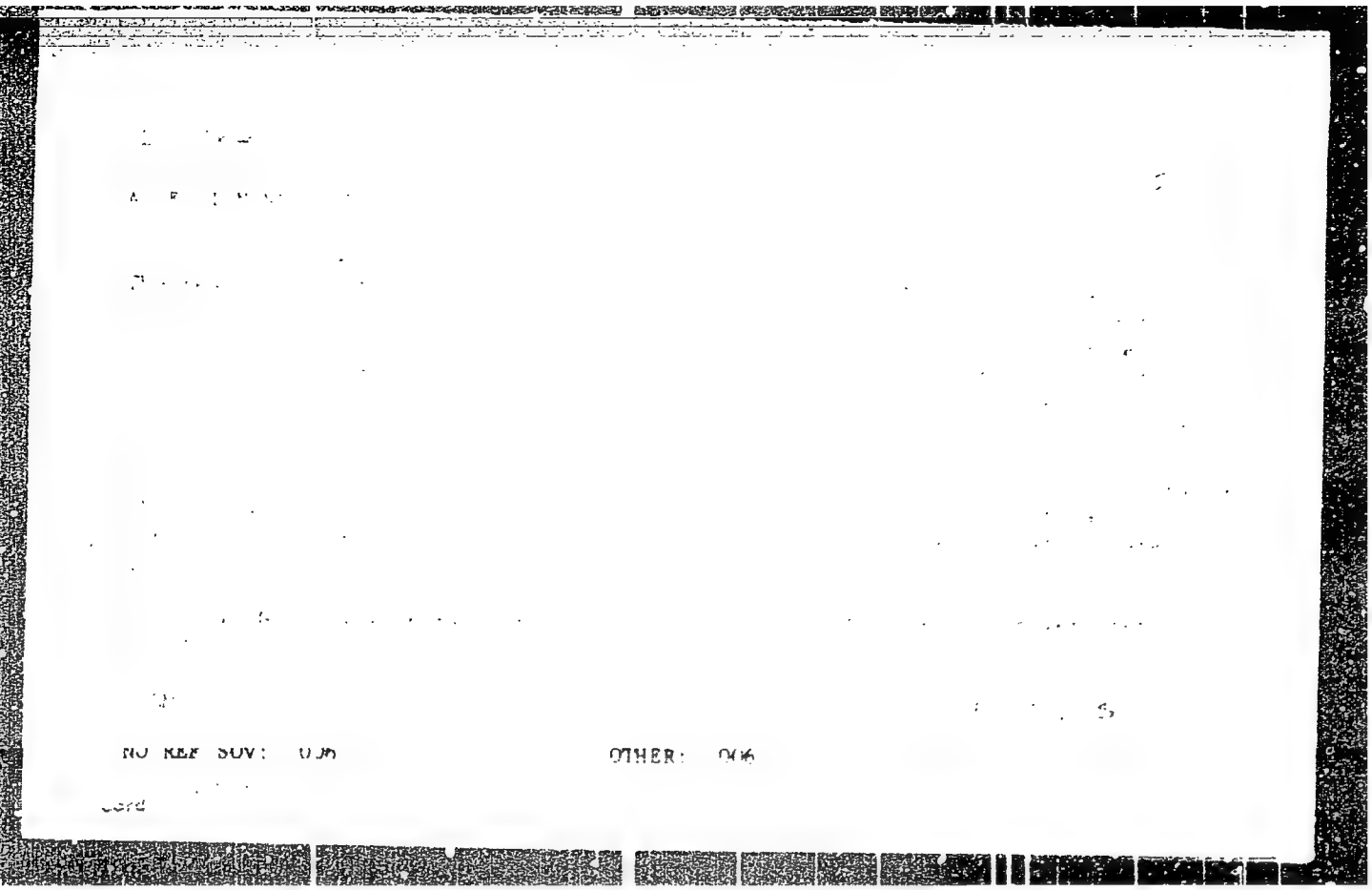
Apparatus for measuring the ... S/078/62/007/006/003/024
B124/B138

+ 61.51 T(kcal/mole of O_2). There are 4 figures and 1 table. The three most important English-language references are: L. S. Darken, R. W. Gurry, J. Amer. Chem. Soc. 68, 799 (1946); J. Smiltens, J. Amer. Chem. Soc. 79, 4877 (1957); J. P. Coughlin, USA Bureau of Mines, Bull. 542 (1954).

SUBMITTED: June 1, 1961

Card 3/3





L 51997-65 EWG(j)/EWT(1)/EWT(m)/...

ACCESSION NR: AP5011339

AUTHOR: Tret'yakov, Yu. D.; Saksonov, Yu. ...; ...rdeyev, ...

Ya. A.; ...

TITLE: Correlation between dissociation pressure and crystal lattice parameters of manganese-containing multicomponent ferrite

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, ..., 412

TOPIC TAGS: manganese ferrite, dissociation, thermal stability, lattice parameter

ABSTRACT: An attempt was made to correlate the dissociation pressure ... solution (Mn Fe ...) ... x-ray data. The object of the study was to ... and stability of manganese-containing ... thermal the electronic industry ...

of these oxides for 5 hours at 1300°C. Dissociation pressures for several

Card 1/2

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R001756610002-3"

L 04997-65

ACCESSION NR: AP5011439

$Mn_xFe_{3-x}O_4$ solid solutions and mixtures of ferrites were measured in the 800-1200°C temperature range. There is an irregularity between composition and the change of lattice parameter a of the solid solutions of magnetite (Fe_3O_4) and hausmannite (Mn_3O_4). This irregularity is due to interchangeable replacement of iron in magnetite with Mn^{2+} and Mn^{3+} ions. In the 800-1100°C temperature range there is a correlation between the dissociation pressure of the manganese-containing multicomponent ferrites and the crystal lattice parameter a. This correlation is independent of the nature of complementary components present in the manganese-containing ferrite. For the Fe_3O_4-$MnFeO_4$ system, the lattice parameter a increases in proportion to replacement of Fe^{3+} ions (r = 0.67 Å), in $Fe^{3+}[Fe^{2+}Fe^{3+}]O_4$ tetrahedra with Mn^{2+} ions (r = 0.91 Å). In the $MnFe_2O_4$-Mn_3O_4 system, the changes in the lattice parameter a are small since Fe^{3+} ions in the $Mn^{4+}[Fe^{3+}_2]O_4$ octahedral spinel units are replaced with Mn^{3+} ions (r = 0.70 Å). Orig. art. has: 2 tables and 3 figures.

ASSOCIATION: Khimicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta im. M. V. Lomonosova (Department of Chemistry, Moscow State University)

SUBMITTED: 01Feb64 ENCL: 00 SUB CODE: EC, SS

NO REF SOV: 006 OTHER: 008

Card 2/2

L 54996-65 EWT(l)/EWG(j)/EWT(m)/EPF(c)/EPR/EWP(t)/EWP(b)/EED-2 Pr-4/Ps-4 IJP(c)
ACCESSION NR: AP5011930 JD/JW UR/0363/65/001/003/0405/0407

AUTHOR: Tret'yakov, Yu. D.

TITLE: Thermodynamic determination of redox equilibrium in manganese ferrite

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 3, 1965, 405-407

TOPIC TAGS: manganese ferrite, manganese, redox equilibrium, ion distribution, phase equilibrium

ABSTRACT: Equilibrium ion distribution in manganese ferrite at 1200°C was determined from experimental data on phase equilibrium in the Fe-Mn-O system and from experimentally determined equilibrium [illegible] tivities are $6.7 \cdot 10^{-3}$ and 0.039, respectively. The free energy change of the reaction $Mn^{3+} + Fe^{2+} \rightleftarrows Mn^{2+} + Fe^{3+}$ at [illegible]

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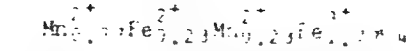
formula:



Orig. art. has: 12 formulas.

ASSOCIATION: Khimicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta (Department of Chemistry, Moscow State University)

SUBMITTED: [illegible]

NO REF SOV: 005 OTHER: 017

Card 2/2

L 55031-65 EWT(l)/EWT(m)/EWP(t)/EP [illegible]

AUTHOR: Oleynikov, N. N.; Saksonov, Yu. G.; Tret'yakov, Yu. D.

TITLE: Phase equilibria in the magnesium oxide-ferrous oxide-ferric oxide system at 1300°C

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 2, 1965, 246-[illegible]

TOPIC TAGS: magnesium oxide, ferrous oxide, ferrite phase diagram, ferric oxide, phase equilibrium, ternary ferrite system

ABSTRACT: The purpose of this work was to extend the measurements of phase equili- [illegible] dent dynamic method for the achievement [illegible] librium. The chemical analysis of [illegible]

Card 1/2

L 55031-65

ACCESSION NR: AP5009375

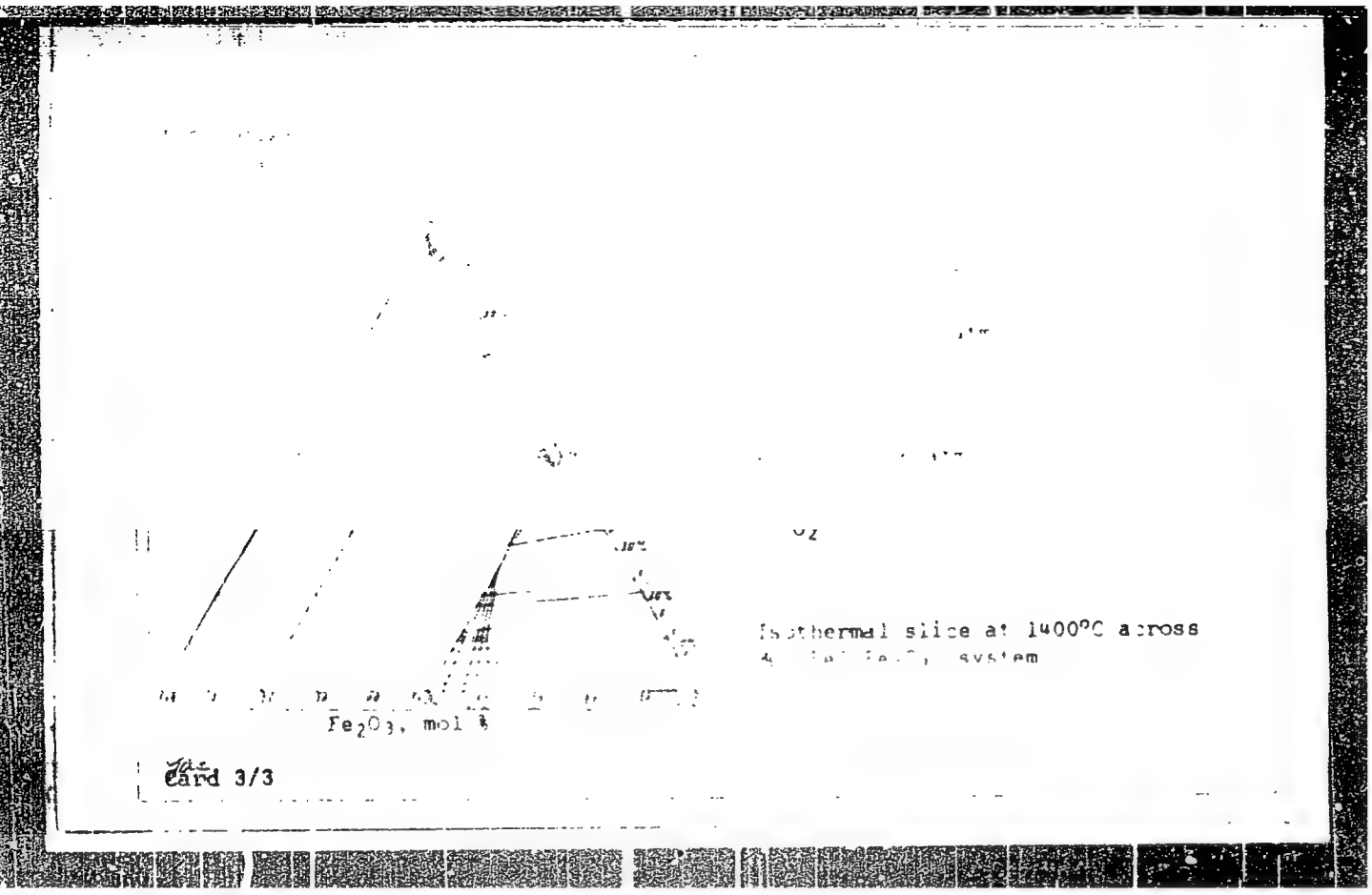
[illegible] isothermal cross-section in the $MnO-FeO-Fe_2O_3$ system at variable pressures

ASSOCIATION: Khimicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta [illegible]

SUBMITTED: 20Jul64 ENCL: 01 SUB CODE: IC, MM

NO REF SOV: 004 OTHER: 017

Card 2/3



Card 3/3

85753

S/189/60/000/003/007/013/XX
B003/B067

9.4300 (3203, 1043, 1143)

AUTHORS: Tret'yakov, Yu. D., Khomyakov, K. G.

TITLE: Study of the Physico-chemical Properties of Certain Ferrites Which Were Obtained by Different Methods. I. Production of the Ferrites of Manganese and Copper by Thermal Decomposition of Isomorphous Solid Solutions of the Sulfates

PERIODICAL: Vestnik Moskovskogo universiteta. Seriya 2, khimiya, 1960, No. 3, pp. 31-36

TEXT: The authors point to the insufficiencies of the ceramically produced ferrites with respect to optimum electric and magnetic properties; the study of these properties is connected with great difficulties. The shortcomings are due to the type of preparation which in all cases leads only to homogeneous mixtures of the initial substances. The authors made the following experiments for producing completely homogeneous ferrites: 1) production of solid isomorphous solutions of Mn and Fe sulfate (double salt) as well as Mn-, Fe- and Cu-sulfate by

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85753

Study of the Physico-chemical Properties of Certain Ferrites Which Were Obtained by Different Methods. I. Production of the Ferrites of Manganese and Copper by Thermal Decomposition of Isomorphous Solid Solutions of the Sulfates

S/189/60/000/003/007/013/XX
B003/B067

isothermal evaporation with constant salt concentrations in the solutions to be evaporated. The apparatus used for this purpose is schematically shown in Fig. 2. The original paper contains detailed theoretical explanations (Fig. 1). An isomorphous mixture of the composition (1/3 Mn, 2/3 Fe) $SO_4 \cdot (NH_4)_2 SO_4 \cdot 6H_2O$ was necessary for preparing $MnFe_2O_4$. Mohr's salt, $(NH_4)_2SO_4$ and $CuSO_4$ (chemically pure) which were recrystallized from bidistilled water as well as $MnSO_4$ obtained by dissolving electrolytic - Mn (99.95%) in sulfuric acid (chemically pure) served as initial substances. The content of foreign admixtures of the purified substances (determined by spectrum analysis) was at the order of magnitude of 10^{-3} to 10^{-2} %(Table). 2) The thermal decomposition of the isomorphous mixtures was made on air at 800 and 900°C and in the CO_2- or N_2 current at 800°C. Fig. 2 shows the curves of the thermal decomposition

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85753

Study of the Physico-chemical Properties of Certain Ferrites Which Were Obtained by Different Methods. I. Production of the Ferrites of Manganese and Copper by Thermal Decomposition of Isomorphous Solid Solutions of the Sulfates

S/189/60/000/003/007/013/XX
B003/B067

of the isomorphous Mn-Fe sulfates in the air current at 800 and 900°C (in the time - weight per cent diagram the weight of the mixtures mentioned first rapidly decreases, then remains constant) as well as $MnSO_4$ at 800°C (flat decrease of weight with time). In the case of thermal decomposition in the air current a completely nonmagnetic oxide mixture was obtained according to the composition $Fe_2O_3+Mn_2O_3$. A decomposition in the CO_2 current led to a strong magnetic mixture of the composition $MnO+Fe_2O_3(=MnFe_2O_4)$. Hence the changes of the valence states of the metal ions can be controlled and completely homogeneous products can be obtained by using an isomorphous mixture. There are 3 figures, 1 table, and 9 references: 5 Soviet, 1 US, 2 French, and 1 British.

Card 3/4

85753

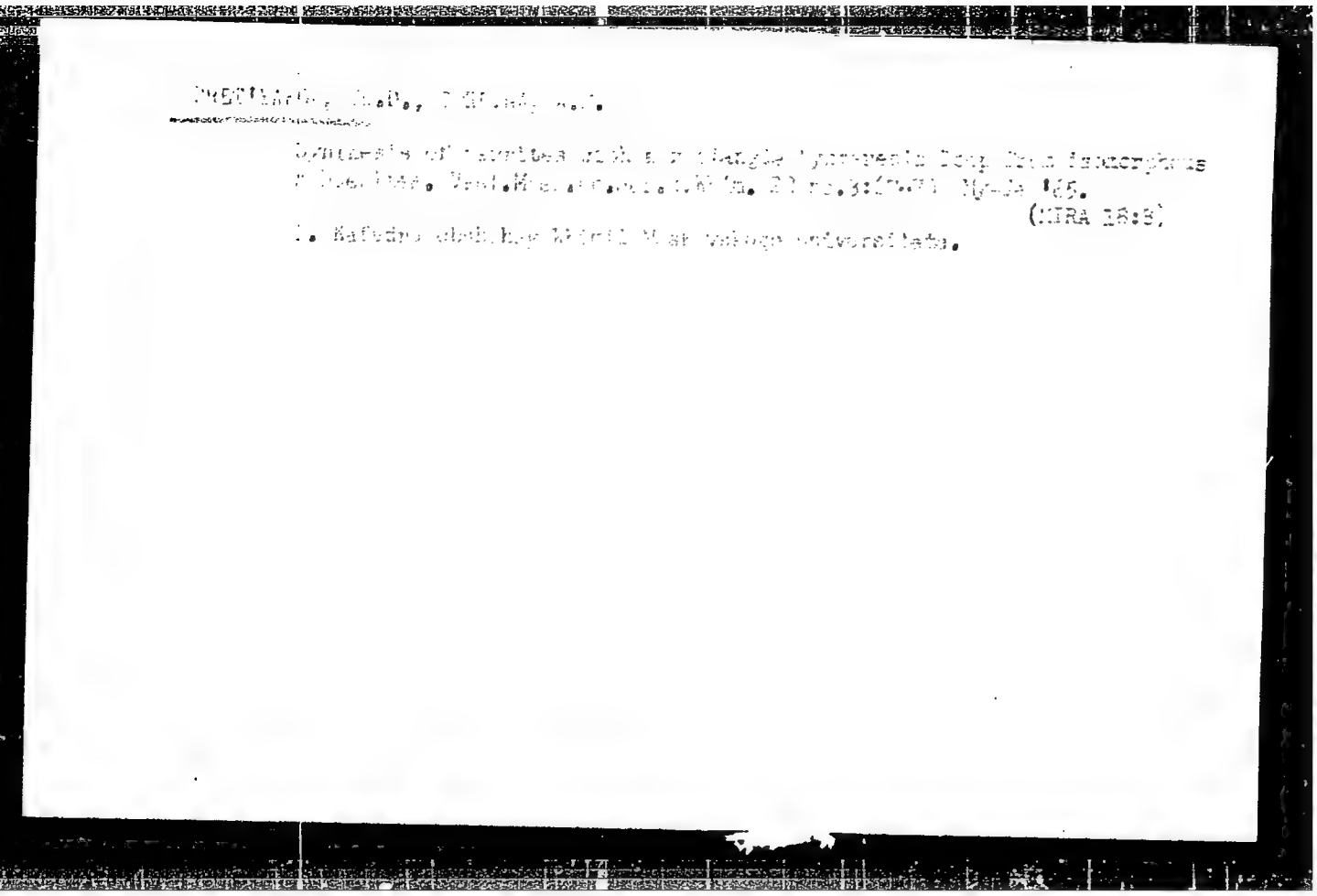
Study of the Physico-chemical Properties of Certain Ferrites Which Were Obtained by Different Methods. I. Production of the Ferrites of Manganese and Copper by Thermal Decomposition of Isomorphous Solid Solutions of the Sulfates

S/189/60/000/003/007/013/XX
B003/B067

ASSOCIATION: Moskovskiy universitet, Kafedra obshchey khimii (Moscow University, Chair of General Chemistry)

SUBMITTED: June 30, 1959

Card 4/4



TRET'YAKOV, Yu.D.; SAKSONOV, Yu.G.; GORDEYEV, I.V.

Phase diagram of the system Fe_3O_4 - Mn_3O_4 - MnO - FeO at 1000°C and the thermodynamic properties of coexisting phases. Izv. AN SSSR. Neorg. mat. 1 no.3:413-418 My '65. (MIRA 18:6)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova, khimicheskiy fakul'tet.

[illegible], Yu.D., [illegible]; GORIZDRA, I.V.; ZAVODCHKOVSKAYA, M.A.; GORBUNA, A.M.

Relation between dissociation pressure and the parameter of a crystal lattice of multicomponent ferrites based on manganese ferrite. Izv. AN SSSR. Neorg. mat. 1 no.3:408-412 Mr '65. (MIRA 18:6)

1. Moskovskiy [illegible] institut [illegible], Khar'kovskiy [illegible].

TRETYAKOV, Yu.D.

Thermodynamic evaluation of the oxidation-reduction equilibrium in manganese ferrites. Dokl. AN SSSR. Neorg. mat. 1 no.3:405-407 Mr '65. (MIRA 18:6)

1. Moskovskiy gosudarstvennyy universitet, Khimicheskiy fakul'tet.

OLEYNIKOV, N.N.; SAKSONOV, [illegible]

Phase equilibria in the system [illegible]
Izv. AN SSSR. Neorg. mat. 1 no.2 [illegible]
(MIRA 18:7)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova, khimicheskiy fakul'tet.

TRET'YAKOV, Yu.D.; OLEYNIKOV, N.N.

Estimation of the defectiveness of spinel structures based on chemical analysis data. Zhur.neorg.khim. 10 no.8:1940-1942 Ag '65. (MIRA 19:1)

1. Submitted October 6, 1964.

TRET'YAKOV, Yu.D.; KHOMYAKOV, K.G.

Heat capacity of the intermetallic compound CoAl after various thermal treatments. Zhur.neorg.khim. 4 no.1:13-16 Ja '59. (MIRA 12:2)

(Cobalt--Aluminum alloys) (Heat capacity)

TRET'YAKOV, Yu.D.; TROSHKINA, V.A.; KHOMYAKOV, K.G.

Adiabatic calorimeter working on the principle of continuous heating.
Zhur.neorg.khim. 4 no.1:5-12 Ja '59. (MIRA 12:2)
(Calorimeters)

TRET'YAKOV, Yu.D.

Synthesis of rare earth ferrites of predetermined composition.
Vest.Mosk. un. Ser.2: Khim. 18 no.4:59-60 Jl-Ag '63.
(MIRA 16:9)

1. Kafedra obshchey khimii Moskovskogo universiteta.
(Rare earth ferrites)

TRET'YAKOV, Yu.D.; KHOMYAKOV, K.G.

Apparatus for measuring the dissociation pressure of ferrites and oxides at high temperatures. Zhur.neorg.khim. 7 no.6: 1219-1224 Je '62. (MIRA 15:6)

(Ferrates)

L 17421-63 EWT(1)/EWP(q)/EWT(m)/BDS AFFTC/ASD JD/JW

ACCESSION NR: AP3004342 S/0078/63/008/008/1814/1819

AUTHORS: Gordeyev, I. V.; Tret'yakov, Yu. D. 57 56

TITLE: Thermodynamics of solid magnesium ferrite - magnetite solutions

SOURCE: Zhurnal neorganicheskoy khimii, v. 8, no. 8, 1963, 1814/1819

TOPIC TAGS: magnesium, magnetite, ferrite, magnesium ferrite, dissociation pressure

ABSTRACT: The thermodynamic properties of solid magnesium ferrite - magnetite solutions were analyzed by e.m.f. method. The cell was heated to 1200C before the experiments were begun. Analysis shows that the quasi-binary behavior of the system with $Mg_xFe_{3-x}O_4$ is preserved at values of $x \leq 0.5$. It was determined that the $Mg_xFe_{3-x}O_4$ solid solution has an insignificant positive deviation from the ideal at various temperatures and where $0<x\leq0.5$. Orig.

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L 17421-63

ACCESSION NR: AP3004342

art. has: 7 figures and 3 tables.

ASSOCIATION: Moskovskiy gosudarstvenny*y universitet, Khimicheskiy fakul'tet, Kafedra obshchey khimii (Moscow State University, Chemical Faculty, Department of General Chemistry)

SUBMITTED: 22Aug62 DATE ACQ: 21Aug63 ENCL: 00

SUB CODE: CH NO REF SOV: 004 OTHER: 017

Card 2/2

L 17829-63 EWP(q)/EWT(m) BDS AFFTC JD/JG

ACCESSION NR: AP3004693 S/0139/63/000/004/0059/0060 54 53

AUTHOR: Tret'yakov, Yu. D.

TITLE: Synthesis of rare-earth ferrites of a predetermined composition 21

SOURCE: Moscow. Universitet. Vestnik. Seriya II. Khimiya, no. 4, 1963, 59-60

TOPIC TAGS: garnet, ferrite, iron, yttrium, yttrium iron garnet, yttrium iron garnet synthesis, yttrium iron garnet stoichiometric composition, rare-earth ferrite, mixed garnet, stoichiometric composition, garnet material, synthesis, coprecipitation method

ABSTRACT: A new [coprecipitation] method has been developed for synthesizing yttrium iron garnets of strictly stoichiometric composition for research purposes. The new process requires less time than other known methods and utilizes minimum quantities of starting materials. The Y_2O_3 is dissolved in HNO_3 and, at the same time, carbonyl iron is dissolved in hot H_2SO_4 and then oxidized with H_2O_2. The two solutions are mixed at 10C or lower, and added to concentrated NH_4OH as the mixture is subjected to intimate mechanical mixing. The resulting coprecipitated yttrium and iron hydroxides are centrifuged, triturated in the presence of ammonia, and dried at 100—150C for 24 hr. The product is again triturated with water,

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L 17829-63

ACCESSION NR: AP3004693

and is then held at 1000C for several hours. A yield of 98—99% was obtained, with a composition as follows: Fe_2O_3, 54.35%; Y_2O_3, 45.64%; and Fe^{2+}, less than 0.01%. The method described may be used to obtain any rare earth ferrites desired. It is particularly valuable for preparing ferrite garnets which are strictly stoichiometric in composition, and "mixed" garnets in which the additional ions must be uniformly dispersed throughout the solid.

ASSOCIATION: Moskovskiy Universitet, Kafedra obshchey khimii (Moscow University, Department of General Chemistry)

SUBMITTED: 04Nov62 DATE ACQ: 06Sep63 ENCL: 00

SUB CODE: CH NO REF SOV: 003 OTHER: 007

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